

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (Cancelled)

2. (Cancelled)

3. (Original) A method for fixing a metal particle, including:

forming a resist film containing a resin component and a metal-containing particle on a substrate; and

removing said resin component in said resist film and fixing a metal particle on said substrate, said metal particle including a metallic element that composes said metal-containing particle,

wherein said metal-containing particle is a metallic compound, and

wherein said method further includes heating said resist film to a temperature of 300 degree C or higher and 1,200 degree C or lower within an inert gas atmosphere or a vacuum, after said forming the resist film and before said removing said resin component and fixing said metal particle.

4. (Original) The method for fixing the metal particle according to claim 3, wherein said removing said resin component and fixing said metal particle includes exposing said resist film to a plasma atmosphere.

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5. (Original) The method for fixing the metal particle according to claim 3 or claim 4, wherein said removing said resin component and fixing said metal particle includes heating to a temperature of 300 degree C or higher and 1,200 degree C or lower within an oxygen gas atmosphere.

6. (Currently Amended) The method for fixing the metal particle according to any one of claims ~~3 to 5~~ 3 or 4, wherein said resist film is a negative-type resist film.

7. (Currently Amended) The method for fixing the metal particle according to any one of claims ~~3 to 6~~ 3 or 4,

wherein said resist film is formed so as to cover the region where said metal particle is to be fixed, and

wherein said metal-containing particles in said resist film are aggregated to fix said metal particle to said region.

8. (Currently Amended) The method for fixing the metal particle according to any one of claims ~~3 to 7~~ 3 or 4, further comprising providing an electrode so as to contact with said metal particle, after fixing said metal particle.

9. (Currently Amended) The method for fixing the metal particle according to any one of claims ~~3 to 7~~ 3 or 4,

wherein an electrode is provided on a surface of said substrate, and

wherein said fixing the metal particle includes aggregating the metal-containing particles in said resist film to fix said metal particle on a surface of said electrode.

10. (Currently Amended) The method for fixing the metal particle according to ~~claim 7 or claim 9~~ claim 7, wherein said metal particle is one per independent pattern and is fixed.

11. (Currently Amended) The method for fixing the metal particle according to any one of claims ~~3 to 10~~ 3, 4 or 10, further including:

forming a diffusion barrier film on said substrate, before said forming the resist film, and

wherein said fixing the metal particle on said substrate includes fixing said metal particle on said diffusion barrier film.

12. (Original) A method for fixing a metal particle, including:

forming a pattern containing a metal component by irradiating charged particle beam onto a substrate within an organic molecular gas atmosphere containing organometallic molecule to deposit a decomposition product of said organic molecular gas containing said metal component in the region where the charged particle beam is irradiated; and

removing the organic constituent in said pattern and fixing a metal particle containing said metal component on said substrate.

13. (Original) The method for fixing the metal particle according to claim 12, further including heating said pattern to a temperature of 300 degree C or higher and 1,200 degree C or lower within an inert gas atmosphere or a vacuum, after said forming the pattern containing the metal component and before said fixing the metal particle on the substrate.

14. (Original) The method for fixing the metal particle according to claim 12 or 13, wherein said removing the organic compound constituent in the pattern and fixing the metal particle includes exposing said pattern to a plasma atmosphere.

15. (Original) The method for fixing the metal particle according to claim 12 or claim 13, wherein said removing the organic compound constituent in the pattern and fixing the metal particle includes heating said pattern to a temperature of 300 degree C or higher and 1,200 degree C or lower within an oxygen gas atmosphere.

16. (Currently Amended) The method for fixing the metal particle according to any one of claims ~~12 to 15~~ 12 or 13,

wherein said pattern is formed so as to cover the region where said metal particle is to be fixed, and

wherein said metal-containing particles in said pattern is aggregated to fix said metal particle to said region.

17. (Currently Amended) The method for fixing the metal particle according to any one of claims ~~12 to 16~~ 12 or 13, further including:

providing an electrode so as to contact with said metal particle, after fixing said metal particle.

18. (Currently Amended) The method for fixing the metal particle according to any one of claims ~~12 to 16~~ 12 or 13,

wherein an electrode is provided on a surface of said substrate, and

wherein said fixing the metal particle includes aggregating the metal-containing particles in said resist film to fix said metal particle on a surface of said electrode.

19. (Currently Amended) The method for fixing the metal particle according to ~~claim 16 or claim 18~~ claim 16, wherein said metal particle is one per independent pattern and is fixed.

20. (Currently Amended) A method for manufacturing a metal particle-containing substrate, including the method for fixing the metal particle according to any one of ~~claims 3 to 19~~ claims 3, 4, 10, 12, 13 or 19.

21. (Currently Amended) A method for manufacturing a substrate containing carbon nanotube on a surface thereof, including:

fixing a metal particle on the substrate; and

allowing a growth of a carbon nanotube by a vapor deposition process with a catalyst of said metal particle,

wherein said fixing said metal particle is conducted by the method for fixing the metal particle according to any one of ~~claims 3 to 19~~ claims 3, 4, 10, 12, 13 or 19.

22. (Currently Amended) A method for manufacturing a substrate containing a carbon nanotube on a surface thereof, including:

fixing a metal particle on the substrate;

disposing an amorphous carbon resin so as to cover said metal particle; and

transferring said metal particle in said amorphous carbon resin by heating said substrate having said amorphous carbon resin disposed thereon to allow the growth of the carbon nanotube in a region where said metal particle is transferred to form a locus,

wherein said fixing said metal particle is conducted by the method for fixing the metal particle according to any one of ~~claims 3 to 19~~ claims 3, 4, 10, 12, 13 or 19.

23. (Currently Amended) A method for manufacturing a substrate containing a semiconductor crystal rod on a surface thereof, including:

fixing a metal particle on the substrate; and

allowing a growth of a crystalline rod of a semiconductor by a vapor deposition process with a catalyst of said metal particle,

wherein said fixing said metal particle is conducted by the method for fixing the metal particle according to any one of ~~claims 3 to 19~~ claims 3, 4, 10, 12, 13 or 19.

24. (New) The method for fixing the metal particle according to claim 3, wherein said heating the resist film includes heating said resist film to a temperature of 400 degree C or higher and 800 degree C or lower within an inert gas atmosphere or a vacuum.

25. (New) The method for fixing the metal particle according to claim 3 or claim 24, wherein said heating the resist film includes heating said resist film within a vacuum.

26. (New) The method for fixing the metal particle according to claim 10, wherein a particle diameter of said one metal particle is controlled by adjusting a concentration of the metallic element in said resist film.

27. (New) The method for fixing the metal particle according to claim 19, wherein a particle diameter of said one metal particle is controlled by adjusting a concentration of the metallic element in said pattern.

28. (New) The method for fixing the metal particle according to claim 26,
wherein said forming the resist film includes leaving a predetermined volume of said resist film on said substrate, and

wherein a particle diameter of said one metal particle is controlled by adjusting said volume of said resist film and a concentration of the metallic element in said resist film.

29. (New) The method for fixing the metal particle according to claim 27,
wherein said forming the pattern includes depositing a predetermined volume of
said pattern on said substrate, and
wherein a particle diameter of said one metal particle is controlled by adjusting
said volume of said pattern and a concentration of the metallic element in said pattern.
30. (New) The method for fixing the metal particle according to claim 3,
wherein said forming the resist film includes:
forming a first resist film that is free of said metal-containing particle; and
forming a second film containing said metal-containing particle after said forming
the first resist film.
31. (New) A method for manufacturing a substrate containing a carbon nanotube on a
surface thereof, including:
fixing a metal particle on the substrate; and
allowing a growth of a carbon nanotube by a vapor deposition process with a
catalyst of said metal particle,
wherein said fixing said metal particle is conducted by the method for fixing the
metal particle according to any one of claims 26 to 29.
32. (New) The method for manufacturing a carbon nanotube-containing substrate
according to claim 22,

wherein said disposing the amorphous carbon resin includes forming a predetermined geometry of a patterned amorphous carbon resin on said substrate, and

wherein said allowing the growth of the carbon nanotube includes moving said metal particle within said patterned amorphous carbon resin to allow the growth of said carbon nanotube, thereby forming a graphite pattern.

33. (New) A method for manufacturing a substrate containing a semiconductor crystal rod on a surface thereof, including:

fixing a metal particle on the substrate; and

allowing a growth of a crystalline rod of a semiconductor by a vapor deposition process with a catalyst of said metal particle,

wherein said fixing said metal particle is conducted by the method for fixing the metal particle according to any one of claims 26 to 29.